STARS ACADEMY LAHORE

MULTAN CAMPUS

Opp: City Hospital 1674/Peer Khursheed Colony Road, Near Chungi No.9, Multan
Head office: 590-Q Main Boulevard, Johar Town Lahore, 0321-9432186, 0321-4693044, www.stars.edu.pk

STARS ENTRY TEST SYSTEM-2019

TEST SESSION MDCAT

Test Code: CTS-8 **Time Allowed: 150min**

BIOLOGY

1. **The reabsorption of glucose from the glomerular filtrate is due to:**
A) High osmotic pressure of filtrate
B) Passive diffusion
C) Secondary active transport across the walls of proximal convoluted part
D) Filtration pressure exerted on the fluids in the loop of Henle

2. **Physiologically urea is produced by the action of an enzyme**
A) Uricase B) Arginase C) Urease D) None of these

3. **Which of the following enzymes is produced in the kidneys?**
A) Rennin B) Uricase C) Renin D) Arginase

4. **Glomeruli are mainly confined to:**
A) Cortex B) Pelvis C) Medulla D) Pyramid

5. **Blood fraction remaining unchanged after circulation through kidney is:**
A) Urea and uric acid C) Urea and proteins
B) Urea and glucose D) Glucose and proteins

6. **Osmoregulation is the control over the:**
A) pH of the blood C) Removal of nitrogen form the body
B) Osmotic properties of cell membrane D) Concentration of salts and water in the body

7. **The most important function of the mammalian kidney is the:**
A) Control of reproduction C) Regulation of amount of protein in the blood
B) Control of amount of protein in the blood D) Regulation of osmotic concentration of body fluid

8. **Kidney of a mammal resembles to the contractile vacuole of Amoeba in expelling gout:**
A) Salts B) Excess water C) Glucose D) Urea and uric acid

9. **The two kidneys of man lie:**
A) at the same level
B) left kidney at a higher level than the right one
C) at the level of ovaries
D) right kidney at a higher level than the left one

10. **The layer of fibrous connective tissue that surrounds each kidney:**
A) Renal sinus B) Renal capsule C) Renal pelvis D) Peritoneal fat

11. **Inner layer of Bowman's capsule consists of:**
A) Podocytes B) Osteocytes C) Nephridia D) Choanocytes

12. **In a mammalian kidney, loops of Henle are mainly located in:**
A) Pelvis B) Medulla C) Cortex D) Major calyx

13. **Which of the following is the most toxic nitrogenous waste:**
A) carbon dioxide B) uric acid C) urea D) Ammonia

14. **To convert ammonia into urea, the liver cells require:**
A) Water B) Oxygen C) Sulphur D) Carbon dioxide

15. **Which enzyme is associated with production of urea:**
A) Urease B) Aspartase C) Arginase D) Glutaminase

16. **First step in urine formation is:**
A) Ultrafiltration C) Tubular secretion
B) Selective secretion D) Tubular reabsorption

17. **The glomerular filtrate i.e., the liquid collected in the cavity of Bowman's capsule is:**
A) Plasma C) urine
B) blood minus proteins D) blood minus proteins and corpuscles

18. **Which of these will be completely reabsorbed from glomerular filtrate under normal conditions in the nephrons:**
A) Urea B) Glucose C) Salts D) Uric acid

19. **Most of the glucose that is filtered through the glomerulus undergoes reabsorption in:**
A) Distal tubule C) Collecting duct

B) Proximal tubule D) Ascending limb of the loop of Henle

20. Part of nephron impermeable to salt is:
A) Descending limb of loop of Henle C) Ascending limb of loop of Henle
B) Distal convoluted tubule D) Collecting ducts

21. The part of the nephron impermeable to water is:
A) Distal tuble B) Proximal tubule C) Collecting duct D) Ascending limb of Henle’s loop

22. Reabsorption of water through the tublues mainly occurs by:
A) Osmosis B) Facilitated diffusion C) Active transport D) Carrier transport

23. Which is mismatched:
A) PCT – Absorption of useful substances C) DCT – Absorption of glucose
B) Bowman’s capsule – Glomerular filtration D) Loop of Henle – Absorption of water

24. Aldosterone stimulates sodium reabsorption in:
A) Descending lib of the loop of Henle C) Ascending limb of the loop of Henle
B) Proximal convoluted tubule D) Distal convoluted tubule

25. Healthy human does not excrete out in his urine:
A) Glucose B) Creatinine C) Uric acid D) B-complex vitamins

26. Which of the following is recovered in the collecting duct of the nephron?
A) Potassium B) Glucose C) water D) Proteins

27. NaCl is more in the interstitial fluid of renal medulla than of cortex because of:
A) cortical loss of Na^+
B) vasa – recta have increased blood
C) counter current mechanism
D) proximal convoluted tubule is more permeable to Na^+

28. Dialysis fluid contains all the constituents as in plasma except:
A) Electrolytes B) Nitrogenous wastes C) Proteins D) All of these

29. Vasa recta and network of blood capillaries occur in association with:
A) Digestive system B) Renal tubules C) Liver lobule D) Skin

30. Human urine is usually acidic because:
A) The sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries
B) Excreted plasma proteins are acidic
C) Potassium and sodium exchange generates acidity
D) Hydrogen ions are actively secreted into the filtrate

31. Plants that are present in severe dry habitat are:
A) Xerophytes B) Hydrophytes C) Mesophytes D) none of these

32. Excretory nitrogen is metabolically converted into urea by:
A) Nitrogen cycle B) Phosphorus cycle C) Urea cycle D) Sulphur cycle

33. Which of the following is not evolutionary adaptations of nitrogenous waste in their habitats:
A) Ureotely B) Ammonotely C) Uricotely D) Both A & B

34. Urine from kidney is passed to urinary balder through a duct called:
A) Urinary bladder B) Urethra C) Ureter D) Renal pelvis

35. In a nephron, a ball of capillaries is present, which is called as:
A) Bowman’s capsule B) Renal pelvis C) Renal artery D) Glomerulus

36. The active uptake of sodium in the ascending limb or thick loop of Henle is promoted by the action of:
A) Thyroxine B) Insulin C) Glucagon D) Aldosterone

37. ADH is released from:
A) Posterior pituitary B) Liver C) Anterior pituitary D) Thyroid gland

38. High level of circulating calcium in blood is:
A) Hemodialysis B) Kidney stone C) Hypercalcemia D) Uremia

39. For non-surgical removal of stone kidney is takes place by:
A) Hemodialysis B) Chemotherapy C) Uremia D) Lithotripsy

40. Poikilotherms include:
A) Invertebrates B) Reptiles C) Amphibians D) All of these

41. Human are categorized in:
A) Poikilotherms B) Homeotherms C) Both A & B D) none of these

42. Select order of toxicity of:
1) Ammonia 2) Urea 3) Uric acid
A) 1 > 2 > 3 B) 3 > 1 > 2 C) 2 > 1 > 3 D) 3 > 2 > 1

43. Counter-current mechanism is present in:
A) Henle Loop B) Vasa recta C) Both A & B D) DCT

44. In deficiency of ADH, rate of micturition:
A) decreases B) remains the same C) increases D) none of these

45. If Henle’s loop were absent from mammalian nephron, which of the following is to be expected?
A) The urine will be more dilute C) There will be no urine formation
B) The urine will have more concentration D) There will be hardly any change in the quality and quantity of

urine formed

46. Which of the following filtrate contains excessive amount of amino acids, glucose, and salts?
A) Glomerular filtrate
B) Filtrate passing through distal convoluted tubule
C) Filtrate passing through ascending limb
D) Filtrate passing through collecting tubules

47. Which of the following constituent is/are maximum in the filtrate that leaves proximal convoluted tubules?
A) Glucose B) Nitrogenous waste C) Amino acids D) All of these

48. A minute vessel runs parallel to the Henle's loop forming 'U' shape vasa recta is a part of
A) Peritubular network B) Afferent arteriole C) Efferent arteriole D) Bowman's capsule

49. Filtration membrane consist of
A) Endothelium of glomerular blood vessels C) Basement membrane between the above two layers
B) Epithelium of Bowman's capsule D) All the above

50. Choose the correct statement.
A) The juxtamedullary nephrons have reduced Henle's loop
B) Vasa recta is well developed in cortical nephrons
C) The PCT and DCT are situated in the medulla of the kidney
D) The ascending limb of the Henle's loop extends as the DCT

51. A large quantity of fluid is filtered every day by the nephrons in the kidneys. Only about 1% of it is excreted as urine. The remaining 99% of the filtrate
A) Gets collected in the renal pelvis C) Is stored in the urinary bladder
B) Is lost as sweat D) Is reabsorbed into the blood

52. The components of homeostatic control system are:
A) Receptors, Neurons and effectors C) Receptors, control system and effectors
B) Receptors, Neurons and glands D) Sense organs, control system and effectors

53. Proximal and distal convoluted tubules are parts of
A) Seminiferous tubules B) Nephron C) Oviduct D) Vas deferens

54. In restricted supply of water the conservation of water (osmoregulation) can bring about:
A) Counter current mechanism
B) Enzymatic mechanism
C) Hormonal mechanism
D) Counter current mechanism, Hormonal mechanism

55. Kidney is involved in excretion of
A) Urea, extra salts and excess water C) Extra urea, extra water and extra amino acids
B) Extra urea, salts and extra water D) Extra urea, extra salts and carbohydrates

56. Which of the following is likely to accumulate in dangerous proportion in the blood of a person whose kidney is not working properly?
A) Lysine B) Urea C) Ammonia D) Sodium chloride

57. In kidneys, urine is produced by three processes
A) Dialysis, ultrafiltration and tubular secretion
B) Ultrafiltration, dialysis and tubular secretion
C) Ultrafiltration, tubular reabsorption and tubular secretion
D) Tubular reabsorption and tubular secretion

58. Animals that produce metabolic heat at low level and also absorb heat from the surroundings are called:
A) Endotherms B) Heterotherms C) Ectotherms D) Homeotherms

59. Which one of the following is a source of hyperoxaluria:
A) Green vegetables and tomatoes C) Infectious disorder
B) Hormonal imbalance D) Kidney failure

60. All of the following are responsible in production of concentrated urine except one; pick up that:
A) Restricted supply of water C) Concentration of filtrate
B) Release of ADH D) Reduction in reabsorption

61. It is used after kidney failure until a matching donor's kidney is transplanted:
A) Dialyzer and dialysis B) Surgery C) Lithotripsy D) Kidney transplant

62. Pick correct pathway of urine flow:
A) Collecting Duct → Renal Pelvis → Ureter → Urinary Bladder → Urethra
B) Renal Pelvis → Ureter → Urinary Bladder → urethra → Renal Pelvis
C) Collecting Duct → Ureter → Urinary Bladder → urethra → Renal Pelvis
D) Urethra → Collecting Duct → Renal Pelvis → Ureter → Urinary Bladder

63. Humans have homeostatic thermostat present in a specified portion of the brain that is:
A) Lateral ventricle B) Thalamus C) Spinal cord D) Hypothalamus

64. The animals which generate their own heat to maintain body temperature are:
A) Endotherm B) Hetrotherm C) Ectotherm D) Both endotherm and ectotherm

65. **Calcium phosphate type kidney stone is caused by:**
A) Hyperoxaluria B) Hypercalcaemia C) Hyperuricemia D) Infectious disease

66. **Which blood vessel contains the least amount of urea?**
A) Hepatic vein B) Renal vein C) Hepatic portal vein D) Renal artery

67. **Sphincter muscles near the junction of the _____ and the _____ control the urine in the bladder:**
A) Ureter, bladder B) Pelvis, ureter C) Urethra, bladder D) Pelvis, bladder

68. **The process is repeated several times a day in case of:**
A) Dialysis B) Peritoneal dialysis C) Hemodialysis D) Lithotripsy

69. **The shockwaves of lithotripsy breaks the kidney stones in tiny pieces or into sand, which are passed out of the body:**
A) In feces B) Through defecation C) In urine D) In sweat

70. **Stony materials are formed in the kidney all of the following EXCEPT:**
A) Uric acid B) Urea C) Oxalate D) Calcium

71. **Lithotripsy is applied on:**
A) Kidney, urinary bladder, gall bladder C) Urinary bladder, kidney, intestine
B) Gall bladder, kidney, liver D) Urinary bladder, kidney, liver

72. **Renal vein leaves the kidney through:**
A) Pelvis B) Renal Hilus C) Bowman's capsule D) Cortex

73. **It is not a function of kidney:**
A) Excretion B) Osmoregulation C) Formation of urine D) Formation of urea

74. **Pressure filtration at glomerulus level is because of:**
A) Glomerulus walls are porous
B) Gaps between podocytes
C) Blood Pressure in capillaries of glomerulus
D) Glomerulus walls are porous, Blood Pressure in capillaries of glomerulus, Gaps between Podocytes

75. **Which is not a poikilotherm?**
A) Invertebrates B) Reptiles C) Amphibians C) Birds

76. **Blood leaves the Bowman's capsules by:**
A) Renal artery B) Renal vein C) Efferent arteriole D) Afferent arteriole

77. **Kidney stones is caused by:**
A) Hyperoxaluria B) Hypercalcaemia C) Infectious disease D) Both A and B

78. **The primary structure for eliminating waste products:**
A) Liver B) Liver and kidneys C) Kidneys D) Liver, kidneys and skin

79. **The vegetarians are at risk of ______ types of kidney stones:**
A) Calcium phosphate B) Calcium oxalate C) Uric acid D) Calcium carbonate

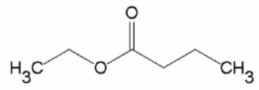
80. **Which of the following is in equal amount in afferent and efferent arteriole of nephron?**
A) Urea B) Water C) Amino Acids D) RBCs

CHEMISTRY

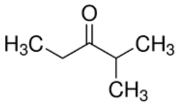
81. **The empirical formula of a compound is CH_2. One mole of the compound has a mass of 42 g. its molecular formula is**
A) C_3H_6 B) $CHCl_3$ C) CCl_4 D) CH_2

82. **A mixture contains four solid organic compounds A, B, C and D. On heating, only 'C' changes from solid to vapour state. The compound 'C' can be separated from the mixture by**
A) Sublimation B) Distillation C) Crystallization D) Fractional distillation

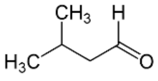
83. **The incorrect IUPAC name is**

A) 

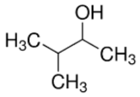
Ethyl butanoate

C) 

2-methyl-3-pentanone

B) 

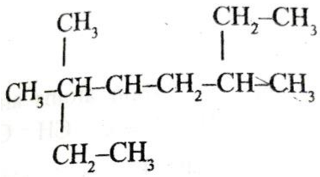
3-methyl butanal

D) 

2-methyl-3-butanol

84. **The compound in which 'C' uses only its sp^3 hybrid orbitals for bond formation is**
A) HCOOH B) $(CH_3)_3COH$ C) $(NH_2)_2CO$ D) CH_3CHO

85. **What will be the IUPAC name of given compound?**



$CH_3-\underset{CH_2-CH_3}{\overset{CH_3}{CH}}-CH-CH_2-\overset{CH_2-CH_3}{CH}-CH_3$

A) 2,5-diethyl-4-mehtylhexane C) 3,3,6-trimethyloctane
B) 2,5,6-trimethyloctane D) 3,5-dimethyl-6-ethylheptane

86. **The isomerism exhibited by propanal is?**
A) Chain isomerism C) Metamerism
B) Geometric isomerism D) Functional group isomerism

87. **How many structural isomers of $C_4H_{10}O$ that are ethers?**
A) 1 B) 3 C) 2 D) 4

88. **The C−C bond length of the following molecules are in the order**
A) $C_2H_6 > C_6H_6 > C_2H_4 > C_2H_2$ C) $C_2H_2 < C_2H_4 > C_6H_6 > C_2H_6$
B) $C_2H_6 > C_2H_2 > C_6H_6 > C_2H_4$ D) $C_2H_4 > C_2H_6 > C_2H_2 > C_6H_6$

89. **The IUPAC name of the compound**
$CH_3-C(CH_3)_2-CH=C(CH_3)_2$ is
A) 1,1,3,3-tetramethyl-but-I-ene C) 1,3,3-trimethyl-pent-2-ene
B) 2,2,4-trimethylbut-t-4-ene D) 2,4,4-trimethylpent-2-ene

90. **3-Methyl-1-butene upon hydrogenation will produce?**
A) Iso-pentane B) n-pentane C) neo-pentane D) 3-Methylbutane

91. **The IUPAC name of $CH_3COCH(CH_3)_2$**
A) 4-methyl isopropyl ketone C) 3-methylbutan-2-one
B) Isopropyl methyl ketone D) 2-methylbutan-3-one

92. **Which of the following has the highest Nucleophilicity?**
A) F^- B) CH_3^- C) OH^- D) NH_2^-

93. **Free radicals are involved in mechanism of**
A) Polymerization of ethene C) Cracking of alkanes
B) Halogenations of alkanes D) All of these

94. **Presence of a $-NO_2$ group around a carban ion**
A) Reduces its stability C) increases its stability
B) Makes no change in its stability D) none of these

95. **Which of the following carbon atoms is most electronegativity?**

III II I
$CH_3 - CH_2 - C \equiv CH$

A) III B) I C) II D) All are equally electronegative

96. **Most stable carbanion is**
A) $(CH_3)_3C^-$ B) $(CH_3)_2CH^-$ C) $(CH_3)_4C^-$ D) $CH_3CH_2^-$

97. **When cyclohexane is poured on water, it floats because**
A) cyclohexane is in boat form C) cyclohexance is in chair form
B) cyclohexane is in crown form D) cyclohexance is less dense than water

98. **The highest boiling point is expected for**
A) iso-octane C) n-octane
B) 2,2,3,3-tetramethyl butane D) n-butane

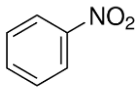
99. **The product formed on reaction of HBr with propene is**
A) 1-bromoproapne B) 3- bromopropane C) 2-bromopropane D) no reaction occurs

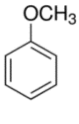
100. **Benzene reacts with CH_3COCI in the presence of anhydrous $AlCl_3$ to give**
A) $C_6H_5CH_3$ B) $C_6H_5O_2CI$ C) C_6H_5CI D) $C_6H_5COCH_3$

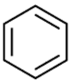
101. **Heterolytic fission of a covalent bond in organic molecules gives:**
A) free radicals B) cations and anions C) only cations D) cleavage not possible

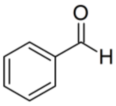
102. **Due to the presence of an unpaired electron, free radicals are:**
A) chemically reactive B) chemically inactive C) anions D) cations

103. **The most reactive compound towards nitration is?**

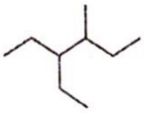
A) 

C) 

B) 

D) 

104. The correct IUPAC name of the following compound is:



A) 4-methyle-3-ethylhexane
C) 3,4-ethylmethylhexane
B) 3-ethyl-4-methylhexane
D) 4-ethyl-3-methylhexane

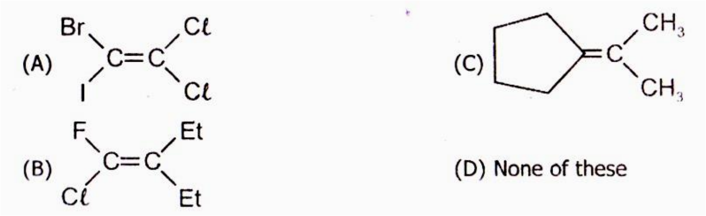
105. What is the simplest alkane, that is, the one with the smallest molecular weight, which possesses primary, secondary and tertiary carbon atoms?

A) 2-Methylpropane B) 2-Methylbutane C) 2-Methylpentane D) 3-Methylpentane

106. The general formula of alkanols is:

A) $C_nH_{2n+1}OH$ B) $C_nH_{2n-1}OH$ C) $C_nH_{2n+2}OH$ D) $C_nH_{2n}OH$

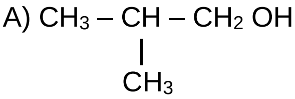
107. Which of the following compound can show geometrical isomerism?

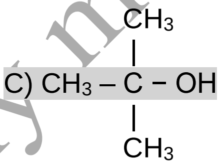


108. Which of the following forms a homologous series?

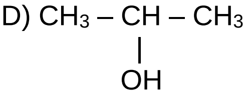
A) ethane, ethene, ethyne
C) ethane, propane, butanone
B) methanol, ethanol, propanoic acid
D) butane, 2-methylbutane, 2,3-dimethylbutane

109. The compound which gives the most stable carbonium ion during dehydration is

A) 
$CH_3-\underset{\substack{|\\CH_3}}{CH}-CH_2OH$

C) 
$CH_3-\overset{\substack{CH_3\\|}}{\underset{\substack{|\\CH_3}}{C}}-OH$

B) $CH_3-CH_2-CH_2OH$

D) 
$CH_3-\underset{\substack{|\\OH}}{CH}-CH_3$

110. The number of σ and π bonds in 1-butene-3-yne is:

A) 5 σ and 5 π B) 7σ and 3π C) 8σ and 2π D) 6σ and 4π

111. Which group is always taken as a substituent in the IUPAC system of nomenclature?

A) $-NO_2$ B) $-C\equiv N$ C) C=O D) COOH

112. The class of compound that does not have sp^2-hydridzed oxygen atom:

A) Esters B) Ethers C) Carboxylic acids D) Acid amides

113. In which of the following species the central carbon atom is negatively charged:

A) Carbanion B) Carbocation C) Carbonium ion D) Free radicals

114. Which of the following contains only three pairs of electrons in the valence shell of central atom:

A) Carbanion B) Carbocation C) Free radical D) None of these

115. Methyl carbanion is iso-electronic with:

A) CH_4 B) $^\bullet CH_3$ C) CH_3^+ D) CH_2^+

116. Select the nucleophile from the following examples:

A) $AlCl_3$ B) NH_2OH C) NO_2^+ D) BF_3

117. Which of these is the rate determining step in the nitration of benzene?

A) Protonation of nitric acid by sulphuric acid
B) Protonation of sulphuric acid by nitric acid
C) Loss of a water molecule by the protonated species to produce the nitronium ion
D) Addition of the nitronium ion to benzene to produce the arenium ion

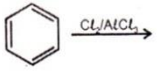
118. Which of the following does not undergo oxidation with alkaline $KMnO_4$ following by acidification with dilute HCl to give benzoic acid?

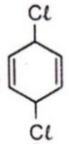
A) Toluene B) Ethylbenzene C) Isoprophylbenzene D) tert-Butylbenzene

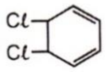
119. According to Markovnikov's rule, when HCl reacts with molecule shown, which product will result? $(CH_3)_2C=CHCH_3 + HCl \rightarrow$?

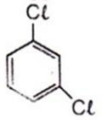
A) $(CH_3)_2CH-CH_2CH_2Cl$ C) $(CH_3)_2CCl-CHClCH_3$
B) $(CH_3)_2CCl-CH_2CH_3$ D) $Cl_2CH-CHClCH_3$

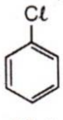
120. What is the product of the following reaction?



(A)


(C)


(B)


(D)


121. In the Friedel-crafts acylation, the electrophile is:
A) $C_6H_5^+$ B) $AlCl_3^-$ C) CH_3CO^+ D) $C_6H_5CH_2^+$

122. When a carbonium ion is formed from CH_3Cl, select the correct statement:
1. Bond angle of 109.5^o is retained
2. Number of sigma bonds is three
3. Carbon undergoes geometric change from tetrahedral to planar
4. Hybridization changes sp^3 to sp^2

A) 2,3 and 4 B) 2 and 4 C) 1,3 and 4 D) 3 and 4

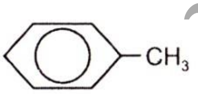
123. Al_2O_3 is used for dehydration of alcohols. The temperature required is?
A) 100^0C C) $340\text{-}450^0C$ C) $140\text{-}170^0C$ D) 85^0C

124. Which reactant should be used to convert propene to 2−chlropropane?
A) BrCl B) NaCl C) Cl_2 D) HCl

125. All are aromatic hydrocarbons except?
A) Biphenyl B) Anthracene C) o-xylene D) Phenol

126. Carbon atoms in benzene molecule are inclined at an angle of:
A) 120^o B) 109.28^o C) 180^o D) 60^o

127. The structure shown is:



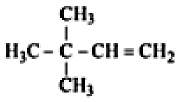
A) Toluene C) aniline
B) para-xylene D) phenol

128. In Friedel Crafts alkylation, besides $AlCl_3$ the other reactants are:
A) $C_6H_6 + CH_3Cl$ B) $C_6H_6 + NH_3$ C) $C_6H_6 + CH_4$ D) $C_6H_6 + CH_3COCl$

129. Which of the following is not o- and p- directing group?
A) $-NH_2$ B) –X (halogens) C) -OH D) –CHO

130. The compound which is not isomeric with diethyl ether is?
A) n-propyl methyl ether C) butan-1-ol
B) 2-methylpropan-2-ol D) butanone

131. The IUPAC name of the compound having the formula?



$$H_3C-\overset{CH_3}{\underset{CH_3}{C}}-CH=CH_2$$

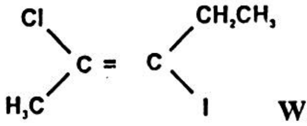
A) 3,3,3-trimethyl-1-propene C) 1,1,1-trimethyl-2-propene
B) 3,3-dimethyl-1-butene D) 2,2-dimethyl-3-butene

132. Which of the following compounds will exhibit geometrical isomerism?
A) 1-phenyl-2-butene C) 3-phenyl-1-butene
B) 2-phenyl-1-butene D) 1,1-diphenyl-1-propene

133. In which of the following compounds, the underlined C-atom is sp^3 hybridized?
A) $CH_3\underline{C}OOH$ B) $CH_3\underline{C}OCH_3$ C) $CH_3\underline{C}H_2OH$ D) $CH_2{=}\underline{C}H-CH_3$

134. Which of the following is used for the conversion of 2-hexyne into cis-2-hexene?
A) $H_2/Pd/BaSO_4$ B) $NaBH_4$ C) H_2,Na/liq.NH_3 D) All of these

135. Correct IUPAC name of compound



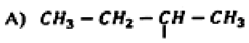
Will be

A) Trans-2-chloro-3-Iodo-2-pentene C) Trans-3-Iodo-4-chIoro-3-pentene
B) Cis-2-chloro-3-Iodo-2-pentenc D) Cis-3-Iodo-4-chloro-3-pentene

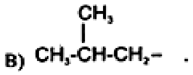
136. The number of π electrons in anthracene is:

A) 10 B) 12 C) 14 D) 8

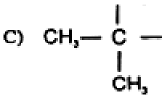
137. Which of the following represents the iso– butyl radical?



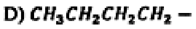
$CH_3-CH_2-CH(-)-CH_3$



$CH_3-CH(CH_3)-CH_2-$



$CH_3-C(CH_3)(-)-$



$CH_3CH_2CH_2CH_2-$

138. Which of the following compound will not show geometric isomerism?

A) 2-Butene C) Styrene

B) 2.3-Dichloro-2-Butene D) 1,2-dichloroethene

139. During pyrolysis of an alkane, C−C bond breaks faster than C−H bond because:

A) C−C bond is stronger C) C−C bond involves H-bonding in alkenes

B) C−H bond is weaker D) The bond energy of C−C bond is less than C−H bond

140. What is the ideal angle involving the H−C−C bond is ethylene?

A) 109.5° B) 120° C) 180° D) 90°

PHYSICS

141. The current flowing through a wire is 3.2 µA. What is the time taken by 20,000 electrons to pass through any cross sectional area of that conductor?

A) 1 ns B) 1 µs C) 1.5 ps D) 1.2 m

142. When there is an electric current through a conducting wire along its length, then an electric field must exist

(A) Outside the wire but normal to it (C) Inside the wire but parallel to it

(B) Outside the wire but parallel to it (D) Inside the wire but normal to it

143. *Ohm*'s law is true

(A) For metallic conductors at low temperature

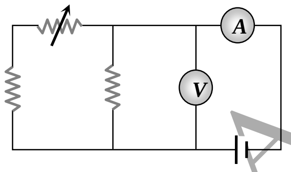
(B) For metallic conductors at high temperature

(C) For electrolytes when current passes through them

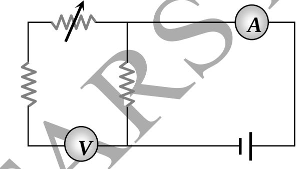
(D) For diode when current flows

144. Express which of the following setups can be used to verify Ohm's law

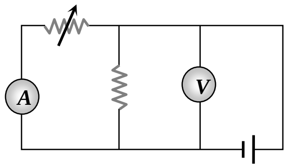
(A)



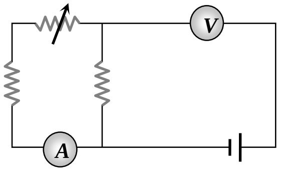
(B)



(C)



(D)



145. A uniform wire of resistance *R* is uniformly compressed along its length, until its radius becomes *n* times the original radius. Now resistance of the wire become

(A) $\frac{R}{n^4}$ (B) $\frac{R}{n^2}$ (C) $\frac{R}{n}$ (D) *nR*

146. A piece of wire of resistance 4 *ohm*s is bent through 180° at its mid point and the two halves are twisted together, then the resistance is

(A)8 *ohms* (B) 1 *ohm* (C) 2 *ohms* (D)5 *ohms*

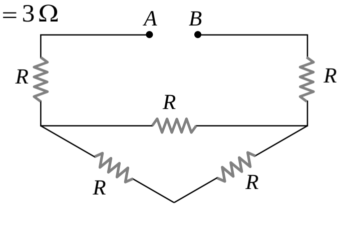
147. Three resistances of one *ohm* each are connected in parallel. Such connection is again connected with $2/3\,\Omega$ resistor in series. The resultant resistance will be

(A) $\frac{5}{3}\Omega$ (B) $\frac{3}{2}\Omega$ (C) 1Ω (D) $\frac{2}{3}\Omega$

148. What is the equivalent resistance between *A* and *B* in the figure below if $R = 3\,\Omega$

(A) $9\,\Omega$

(B) $12\,\Omega$



(C) 15Ω

(D) 8Ω

149. There are n similar conductors each of resistance R. The resultant resistance comes out to be x when connected in parallel. If they are connected in series, the resistance comes out to be

(A) x/n^2 (B) n^2x (C) x/n (D) nx

150. Two resistors are connected (a) in series (b) in parallel. The equivalent resistance in the two cases are 9 ohm and 2 ohm respectively. Then the resistances of the component resistors are

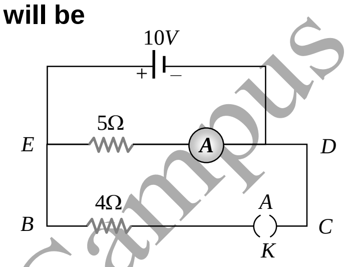
(A) 2 ohm and 7 ohm (C) 3 ohm and 6 ohm

(B) 3 ohm and 9 ohm (D) 5 ohm and 4 ohm

151. In the given figure, when key *K* is opened, the reading of the ammeter *A* will be

A)50 A C)2 A

B)0.5 A D) $\frac{10}{9}A$



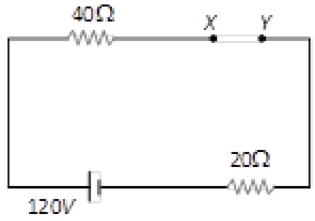
152. In the circuit shown, potential difference between X and Y will be

A) Zero

B) 20 V

C) 60 V

D) 120 V



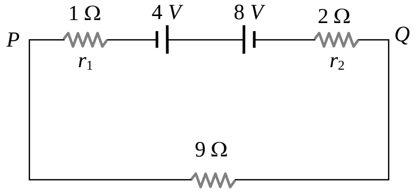
153. A certain resistor dissipates 0.5W when connected to a 3 V potential difference. When connected to a 1 V potential difference, this resistor will dissipate:

A) 0.5W B) 0.167W C) 1.5W D) 0.056W

154. It is better to send 10, 000 kW of electric power long distances at 10, 000 V rather than at 220 V because:

A) there is less heating in the transmission wires
B) the resistance of the wires is less at high voltages
C) more current is transmitted at high voltages
D) the insulation is more effective at high voltages

155. Two batteries of e.m.f. 4*V* and 8 *V* with internal resistances 1 Ω and 2 Ω are connected in a circuit with a resistance of 9 Ω as shown in figure. The current and potential difference between the points *P* and *Q* are



(A) $\frac{1}{3}A$ and $3V$ (C) $\frac{1}{6}A$ and $4V$

(B) $\frac{1}{9}A$ and $9V$ (D) $\frac{1}{2}A$ and $12V$

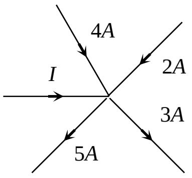
156. In the given current distribution what is the value of *I*

(A) 3*A*

(B) 8 *A*

(C) 2*A*

(D) 5*A*



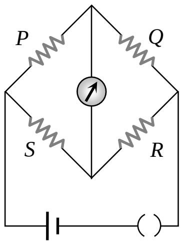
157. In the Wheatstone's bridge shown, $P=2\Omega$, $Q=3\Omega$, $R=6\Omega$ and $S=8\Omega$. In order to obtain balance, shunt resistance across '*S*' must be

(A) 2Ω

(B) 3Ω

(C) 6Ω

(D) 8Ω

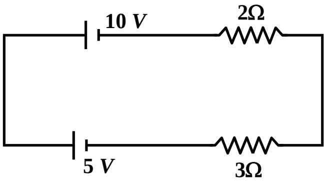


STARS Academy Campus

158. A 2 *volt* battery, a $15\,\Omega$ resistor and a potentiometer of 100 cm length, all are connected in series. If the resistance of potentiometer wire is $5\,\Omega$, then the potential gradient of the potentiometer wire is
(A) 0.005 *V/cm* (B)0.05 *V/cm* (c) 0.02 *V/cm* (D)0.2 *V/cm*

159. For measurement of potential difference, potentiometer is preferred in comparison to voltmeter because
(A) Potentiometer is more sensitive than voltmeter
(B) The resistance of potentiometer is less than voltmeter
(C) Potentiometer is cheaper than voltmeter
(D) Potentiometer does not take current from the circuit

160. Determine the current in the following circuit



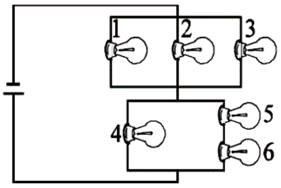
A) 1 A
B) 2.5 A
C) 0.4 A
D) 3 A

161. The potential gradient along the length of a uniform wire is $10\,volt/metre$. B and C are the two points at $30\,cm$ and $60\,cm$ point on a meter scale fitted along the wire. The potential difference between B and C will be
(A) $3\,volt$ (B) $0.4\,volt$ (C) $7\,volt$ (D) $4\,volt$

162. A potentiometer is used for the comparison of e.m.f. of two cells E_1 and E_2. For cell E_1 the no deflection point is obtained at 20 cm and for E_2 the no deflection point is obtained at 30 cm. The ratio of their e.m.f.'s will be
(A) 2/3 (B) ½ (C)1 (D)2

163. Sensitivity of potentiometer can be increased by
(A) Increasing the e.m.f. of the cell
(B) Increasing the length of the potentiometer wire
(C) Decreasing the length of the potentiometer wire
(D) None of the above

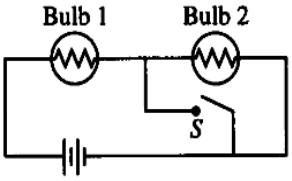
164. Six identical light bulbs are connected to a battery to form the circuit shown. Which light bulb(s) glow the brightest?



A) 1, 2 and 3
B) 5 and 6
C) 1, 2, 3 and 4
D) 4 only

165. Two resistances R_1 and R_2 are connected with two identical batteries 9 volt. If $R_1 = 2R_2$ then current through R_1 is
A) Twice that through R_2 C) Half than that R_2
B) Equal to that through R_2 D) One fourth of R_2

166. The circuit in the figure above contains two identical lightbulbs in series with a battery. At first both bulbs glow with equal brightness. When switch S is closed, which of the following occurs to the bulbs?



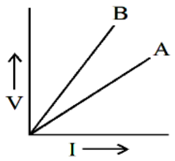
Bulb 1	**Bulb 25**
A) Goes out	Gets brighter
B) Gets brighter	Goes out
C) Gets brighter	Gets slightly dimmer
D)Gets slightly dimmer	Gets brighter

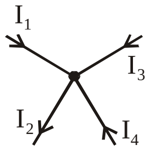
167. A wire has a current of 2A in it. How much charge passes a passes a point in the wire in one minute.
A) 2C B) 60C C) 30C D) 120C

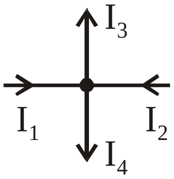
168. In ohms law which physical quantity remains constant
A) Voltage B) Current C) Temperature D) All of these

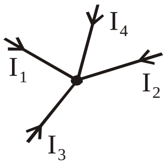
169. When emf source is supplying current to any external circuit then, which one is true?
A) $E = V_t$ B) $E > V_t$ C) $E < V_t$ D) All possible

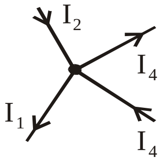
170. The diagram show four different ways in which currents I_1, I_2, I_3 and I_4 can combine at a junction for which of these junctions. The following equation of current is justify $I_1 + I_2 = I_3 + I_4$:



A)


B)


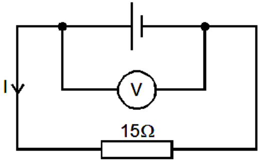
C)


D)


171. **V-I graphs for parallel and series combination of two metallic resistors are as shown in figure which graph represents parallel combination?**

A) line A B) line B C) Both A and B D) Neither A nor B

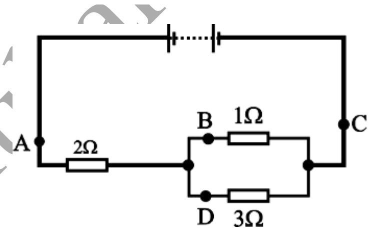
172. **The e.m.f. of the cell in the following circuit is 9.0V. The reading on the high-resistance voltmeter is 7.5V. What is the current I?**



A) 0.1A C) 0.5A

B) 0.6A D) 2.0A

173. **At which point in the circuit is the current the smallest?**



A) at point A

B) at point B

C) at point C

D) at point D

174. **When wheatstone bridge is balanced then galvanometer shows:**
(A) Maximum deflection (B) Zero deflection (C) In between (a), (b) (D) None of these

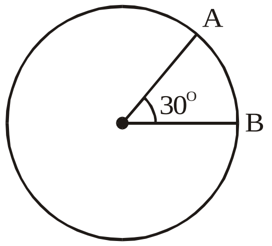
175. **The product of resistance and conductance is:**
(A) 1 (B) Resistivity (C) Conductance (D) Zero

176. **In a conductor the drift velocity of free electrons in the absence of applied voltage is of the order of:**
(A) 10^{-3} m/s (b) 10^{3} m/s (C) Zero (D) Infinite

177. **Maximum power is delivered to a load when:**
(A) Internal resistance = $(\text{External resistance})^2$ (C) Internal resistance > External resistance
(B) Internal resistance < External resistance (D) Internal resistance = External resistance

178. **The instrument which measures potential difference accurately:**
(A) Potentiometer (C) Digital voltmeter
(B) Cathode ray oscilloscope (D) All

179. **A uniform wire of resistance 36 Ω is bent in the form of a circle. The effective resistance between A and B is:**



(A) 2.75 Ω (C) 3 Ω
(B) 33 Ω (D) 36 Ω

180. **The resistance of a wire is R. it is stretched uniformly so that its length is doubled. The resistance now becomes**
A) 2R C) 4R
B) R/2 D) R/4

ENGLISH

Choose the correct word words to complete each sentence.

181. **All bills that are paid _________ will be discounted at three percent.**
A) promptly B) vulnerably C) legibly D) capriciously

182. **There is a _____ in the rules that allows you to invest money without paying tax.**
A) quirk B) sequel C) smother D) strife

183. The manager has no _______ about dropping players who do not perform well.
A) verve B) veracity C) qualm D) aplomb

SPOT THE ERROR: In the following sentences some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected. Fill the circle corresponding to that letter under the segment in the MCQ Response Form.

184. Our boss does not let us to eat lunch at our desks; we have to eat in the cafeteria.
A B C D

185. All the students were made rewrite their papers, because the first drafts were not acceptable.
A B C D

186. While she was travelling to the airport, she has seen an accident on the road.
A B C D

187. Such is the littleness of our home in space when measured out against the total substance of the universe.
A B C D

188. One of the most important problems of the growth of cities has been to provide sufficient water to meet the
A B C
many needs of an increasing population.
D

189. They are responsible for his being here, and consequently they have the responsibility for giving him the
A B C
best equipment possible to meet the world problems.
D

In each of the following questions, four alternative sentences are given Choose the CORRECT one and fill the circle corresponding to that letter in the MCQ Response Form.

190.

A) Even the early doctors knew that washing hands prevents infection.
B) Even the early doctors knew that washing hands prevent infection.
C) Even the early doctors knows that washing hands prevents infection.
D) Even the early doctors knew that washing hands prevented infection.

191.

A) His father will not let him to adopt a puppy because he is allergic to dogs.
B) His father will not let him adopt a puppy because he is allergic from dogs.
C) His father will not let him adopts a puppy because he is allergic to dogs.
D) His father will not let him adopt a puppy because he is allergic to dogs.

192.

A) The businessman had his secretary made copies of the report.
B) The businessman had his secretary to make copies of the report.
C) The businessman had his secretary make copies of the report.
D) The businessman had his secretary makes copies of the report.

193.

A) He always gets me help with her homework.
B) He always gets me to help with her homework.
C) He always gets me helps with her homework.
D) He always gets me helped with her homework.

194.

A) Young Faulkner had met him there on the lane outside the School.
B) Young Faulkner had met him there in the lane outside of the School.
C) Young Faulkner had met him there to the lane outside the School.
D) Young Faulkner had met him there in the lane outside the School.

195.

A) He had been leaning his elbows on them; they were all addressed to him by name.
B) He had been leaning his elbows over them; they were all addressed to him by name.
C) He had been leaning his elbows on them; they were all addressed by him by name.
D) He had been leaning his elbows on them; they were all addressed to him from name.

196.

A) He asserted that Allah puts those tonsils in his son’s throat for some good purpose.
B) He asserted that Allah put those tonsils in his son throat for some good purpose.
C) He asserted that Allah put those tonsils in his son’s throat of some good purpose.
D) He asserted that Allah put those tonsils in his son’s throat for some good purpose.

197.

A) Today we are better able to explain happenings which used to be considered strange and mysterious.
B) Today we are better able to explain happening which used to be considered strange and mysterious.
C) Today we are better able to explain happenings which used to be considered strange and mysteriously.
D) Today we are better able to explain happenings which used to be considered strangely and mysterious.

In each of the following questions, four alternative meanings of a word are given. You have to select the NEAREST CORRECT MEANING of the given word and fill the appropriate Circle on the MCQ Response Form.

198. Precision

A) Lucidity B) skirmish C) penury D) suite

199. Pizzazz

A) perturbation B) strive C) run-on-the-mill D) Get-up-and-go

200. Quantitative

A) simulation B) defamation C) weighable D) venomous

201. Quench

A) lessen B) squelch C) aggravate D) deteriorate

202. Quiver

A) stir B) spur C) nub D) onus

203. Prone to

A) predisposed B) apposed C) appendages D) Privilege

In each of the following questions, four alternative meanings of a word are given. You have to select the opposite in meaning of the given word and fill the appropriate Circle on the MCQ Response Form.

204. Potential

A) impotence B) aptitude C) capability D) potency

205. Paraphernalia

A) stupendous B) expeditious C) superfluous D) meticulous